forms of birds and reptiles and going straight to the amphibia for the progenitors of the mammalia are quoted with approval; and that author's subdivision of the class into three sub-branches—Prototheria, Metatheria, and Eutheria—is adopted. The history of the distribution of the mammals in time and space follows; and then we have the characters of the different orders and families, and of the principal forms of the class. In this section of the memoir the illustrations, taken from the best sources, are especially to be praised, and in many instances the information as to rare or new species is brought well up to date. This seems to us especially so in the interesting group of the bats and insectivora, for which Prof. Flower acknowledges his indebtedness to Dr. G. E. Dobson, but in the portion devoted to the order Primates, an order which Prof. Flower makes to include the lemurs, the monkeys, and man, we read the little that is written under the impression that it was but introductory to a good deal that was to follow, and when we turned over to p. 446 we found the essay was finished and that we had arrived at the index; even this bears marks of a forced compression, for while the earlier letters are fairly done, the last in the index have evidently had a lot "squeezed" out.

One other article relating to zoology in this volume is also by Prof. W. H. Flower, on the "Mammoth." He alludes to the derivation of this name as being by some ascribed to a Tartar origin, by others that it is a corruption of the Arabic word *Behemoth*, or great beast, but on the authority of Prof. Sayce it is a corruption of the Biblical Behemoth, Arabic behîmat.

The scientific articles in vol. xvi. are so numerous and important that it is impossible for us to give them satisfactory notice in the space at our disposal; we can do no more than name the more important. From Prof. Dittmar we have Metallurgy and Metals; Prof. Chandler Roberts and Mr. R. A. Hill contribute the article on Mint, in which all aspects of the subject are fully as well as interestingly treated; while Mining, by Dr. Le Neve Foster, is both practical and scientific. Meteorology, of course, has been undertaken by Mr. Buchan and Prof. Balfour Stewart, and forms an admirable exposition of the present condition of a science of great and growing complexity; Mr. Buchan treating of instruments and phenomena, while Prof. Stewart deals with the science that underlies the subject. The article on Micrometer is by Dr. David Gill; while it is natural to find Dr. W. B. Carpenter's name attached to that on Microscope. Prof. Heddle contributes an elaborate and profusely illustrated article on Mineralogy. Molecule has a triple authorship, Rev. H. W. Watson, Mr. S. H. Burbury, and Prof. Crum Brown, both its physical and chemical aspects being thus fully treated. The article on Mollusca in this volume, by Prof. Ray Lankester, is as complete and masterly and richly illustrated as that on Mammalia in the previous volume. Under Moon we have a short article on the lunar theory, by Prof. Simon Newcomb; other aspects of the subject have been dealt with under Astronomy. Mr. P. Geddes has a careful and wonderfully exhaustive article on Morphology; and Mr. R. M'Lachlan finishes off the volume with a somewhat tiny article on Mosquito. There are many other smaller articles in all departments of science,—Prof. A. Newton, for example, doing all birds,—and several important ethnologico-geographical articles, as Mexico, by Mr. E. B. Tylor and Prof. Keane, and Mongols, by Prof. Douglas and Prof. Jülg. We hope in a future number to be able to refer in detail to some of the articles mentioned.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Living Scorpions, Mygale, and Protopterus

WILL you allow me to use your columns in order to ask any of your readers residing in tropical localities, who may be generous enough to wish to help a naturalist in his researches, to send to me *living* specimens of *large* Scorpions (not less than three inches in length), and *living* specimens of large Mygale (birdsnesting spider); also I would beg for *living* Earthworms of large size from African, Indian, American, and Australian localities. Any of these animals can be sent in a small tin box in which a few holes are perforated; the tin box being packed in a much larger wooden box with hay or loose paper. Damp moss should be placed with the Scorpion or Mygale. Each specimen should be inclosed in a separate tin box, since these animals are cannibals. The holes in the tin box containing an Earthworm should be very few, and the amount of damp moss very great. Earthworms would travel best in a Wardian case, should the opportunity offer—not loose, but in the above-mentioned tin box.

I would further take this opportunity to ask for information concerning the best way of keeping the African Lepidosiren, or mud-fish (*Protopterus annectens*), in confinement. I require to ascertain (1) its natural food, (2) the temperature of the waters in which it naturally lives, (3) whether these are stagnant or rapidly running, (4) whether anything is known as to habits in the breeding season, and if this season immediately precedes or succeeds the dry season.

Some of your readers in this country or in Africa may have gained experience on these points, and would greatly help me in an attempt to breed the mud-fish by communicating with me.

E. RAY LANKESTER

11, Wellington Mansions, North Bank, N.W.

Electricity in India.—The Green Sun

[THE following letter has been sent us for publication by Sir William Thomson, to whom it is addressed :—]

For nearly a month the air has been in a state of electrification, which seems to me so interesting that I thought you would probably like to hear of it at once without my waiting to complete my observations. Unfortunately I cannot tell the exact date at which it began, but August 31 showed positive electricity all day apparently. On September 1 and 2, I was not able to get any measurements, but on the 3rd at 1.10 p.m., I got negative readings from –28 to –17 div., wind light, S. by W. By 2.45 it had changed to +6. Next morning at 10.5 a.m. it varied from –136 to –44; this was on the roof. I then took it to the ground, to a place quite open, and found readings from –460 in gusts of wind to –162 when the wind was light. The wind was fresh, westerly. Up to 1h. 14m. it continued negative, but at my next reading, 3 p.m., it was +35, and remained steadily positive, the wind having now gone round to the east (sea breeze).

5th, 6 a.m., positive, from 9 a.m. to 2.5 negative, and thereafter positive.

This continued with the exception of the 9th, when it was positive all day till the 13th.

On the 20th the reading at 9.55 was –34, but at 11.55 it was +44, the wind in the meanwhile having changed from west (land wind) to east (sea breeze). A similar state of affairs still continues.

During all this time the weather in Madras has been fine, and

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for some days at first, when I made very special inquiries, I found that no rain had fallen within 100 miles of Madras. It may perhaps be worth mentioning that from the 8th to the 14th we have had the strange phenomenon of a bright green sun at sunrise and sunset, the sun appearing as a rayless globe, at which you could easily look, and yet so sharply defined that sunspots could be well seen with the naked eye. On the 22nd again, two days after the electricity had gone to positive, the green sun reappeared, and has now changed to a sort of golden green. I do not say that there is any connection between the two, but they seem worth mentioning together. I have got a large number of observations which I will reduce as soon as possible, and send to the Royal Society of Edinburgh, but there is no use doing this till things return to their normal state. It is worth pointing out that observations made at intervals of six hours might have entirely failed to find the negative electricity. I usually, for convenience, take observations at 9 a.m., before leaving for college, and the next would be at three, and both these are always positive. I have not got the exact scale of my electrometer, but I find that 100 Daniell's cells give only 24 div. of a deflection. I am very much disappointed that I have not got my new instrument yet. Had I had it I would have been able to get simultaneous observations carried on at Madras and at a place forty miles to the west, which might have given valuable results. My present instrument, though working better than before, needs constant recharging. For example, at noon yesterday the earth reading was 1750, and at six this morning it was only 1440. C. MICHIE SMITH

Christian College, Madras, September 26

Unusual Cloud-Glow after Sunset

YESTERDAY evening a most extraordinary sunset effect was seen here, which made a deep impression on all who observed it. The sky was nearly clear when the sun set at 4.18, and the air transparent. A few cirrocumulus fleeces became lighted up with a pink and then with a deep red colour immediately after sunset. A very peculiar greenish and white opalescent haze now appeared about the point of the sun's departure, and shone as if with a light of its own, near the horizon. The upper part of this pearly mist soon assumed a pink colour, while the lower part was white, green, and greenish-yellow. About 4.35 the sky from near the horizon towards the zenith had begun to turn to a brilliant but delicate pink, and some pink cirrus-like streaks stretched apparently horizontally towards the south-east. The coloured portion of the sky spread out like a sheaf from the horizon, and apparently consisted of a very high, thin filmy cirrus disposed in transverse bands or ripples, close together, and very delicate in form, outline, and tint. Below the pink, and between it and the point where the sun had set, remained the very curious, opalescent, shining, green and white vapour, hanging, as it were, vertically, and changing very little during many minutes. The borders of the pink sheaf were definite, and finely contrasted with the deep blue sky. As darkness came on, the pink glow seemed to increase in brightness, and at five o'clock cast a fine weird light over the hills. The moon was now bright in the south-east, and began to cast dark shadows. About five the colour slowly receded from the part nearest the zenith towards the horizon, and as it retired left a clearly visible filmy ripple of cirrus of a faint gray tint. At 5.25 the greater part of the colour was gone, and the cloud remained bright only near the horizon. At 5.32, however, it began to grow again, and in a short time (5.40) the whole extent of the film was again glowing bright pink, producing a most striking effect in contrast with the silvery moon, dark sky, and bright stars in the north and east. The pink light then slowly withdrew towards the horizon, remaining bright and deep coloured low down till 5.50. At 5.58 the last pink disappeared. The whole phenomenon from first to last was in the highest degree peculiar and striking. It was remarkable, first, for the interval which elapsed between the time of sunset and the time at which the cloud became bright, next for the light, filmy character of the cloud, thirdly for the bright green glow near the place of sunset, fourthly for the small transverse ripple form of the cloud, fifthly for the permanence of shape and immobility of the cloud, sixthly for the very long endurance of the coloured reflected sunlight after sunset, one hour and forty minutes, and seventhly for the second illumination, which began more than an hour after sunset. It was certainly due to cirrus or a higher kind of cloud, because (1) parts of the illuminated sky stretched in long streaks southwards, and the glow remained long in these streaks, resembling very high cirrus; (2) when the light left the sky the first time, the part which had been illuminated remained visible as silvery gray cloud ripples, before the second after-glow rekindled it, and (3) because the colour became very gradually darker as time went on, and because the recessions of light both times were towards the place of sunset. A similar very high cirrus had also been specially marked long after sunset on November 8, and about the time of sunrise on November 9. The night following this rare display was exceedingly clear and fine. This evening (November 10) the light, high cirrus, all but invisible in full daylight, with its delicate ripples, assumed the pink tint about fifteen minutes after sunset, showing the upper air to be in the same abnormal condition as yesterday, and the phenomenon was feebly repeated. It would be interesting to ascertain the approximate height of cirrus on which sunshine remains one hour and forty minutes after sunset at this time of year. F. A. R. RUSSELL

Dunrozel, Haslemere, Surrey, November 10

Shadow-Beams in the East at Sunset

THE phenomenon of beams of shadow meeting in the east at sunset, treated of in the pages of NATURE some months since (at which time you did me the honour of inserting a letter of mine), was beautifully witnessed here to-day and yesterday. Both days were unusually clear; there was, nevertheless, a "body" in the air, without which the propagation of the beams could not take place. Yesterday the sky was striped with cirrus cloud like the swaths of a hayfield; only in the east there was a bay or reach of clear blue sky, and in this the shadow-beams appeared, slender, colourless, and radiating every way like a fan wide open. This lasted from 3.30 to about 4.30. To-day the sky was cloudless, except for a low bank in the west; in the east was a "cast" of blue mist, from which sprang alternate broad bands of rose colour and blue, slightly fringed. I was not able to look for them till about 4.30, when the sun was down, and they soon faded. I have not before seen this appearance so far north, but on the south coast, where I first saw it, I think it might often be witnessed. It is merely an effect of perspective, but a strange and beautiful one.

Stonyhurst College, November 12 GERARD HOPKINS

The Java Eruption

THE accompanying paragraph may be of interest in connection with the Java catastrophe. I may mention that from the 28th of last month, when I first noticed it, there has been an exceptional red glow after sundown, and a strange green tint in the sky, while till the last few days the moon has had a distinctly green tint; this green tint has been noticed in many parts of India. F. C. CONSTABLE

Karachi, October 16

A FLOATING LAVA BED.—Sir,—It may be interesting to some of your scientific readers to know that the steamship *Siam*, on her voyage from King George's Sound to Colombo, on August 1, when in lat. 6° S., 89° E., passed, for upwards of four hours, through large quantities of lava, which extended as far as could be seen (the ship was going eleven knots at the time). The lava was floating in a succession of lanes from five to ten yards wide, and trending in a direction north-west to south-east. The nearest land was the coast of Sumatra (distant 700 miles), but as there was a current of fifteen to thirty miles a day, setting to the eastward, the lava could not have come from there, and I can only imagine it must have been an upheaval from somewhere near the spot. I may mention the soundings on the chart show over 2,000 fathoms. There was a submarine volcano near the spot in 1879.—EDWARD ASHDOWN, Commander, P. and O. steamship *Siam*. (*Sind Gazette Bulletin*, October 12.)

Towering of Birds

WHEN shooting in Fifeshire last October I fired at a partridge at a distance of about forty yards; the bird flew on for a short distance, and then began to rise, not in the manner in which a towering bird generally ascends, but soaring as if it did so voluntarily. After rising to the height of 100 or 150 yards very much after the fashion in which some hawks soar, its flight was suddenly deflected downwards obliquely for a considerable distance,

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